

IDEAL Health handbook

What's it all about? (P. 1-4)

- + On average, we spend about 90% of the day indoors.
- + Air has the largest share (74%) of all the substances we consume every day (beverages 18%, food 8%).
- + Room air is full of pollutants: Small particles such as pollen, dust, particulates, gases and odours, ...
- + Substances that we breathe in cause harm to the body, lead to a lack of well-being and chronic diseases.
- + Airing a room yourself, often simply leads to new pollutants and particulates entering the room. Depending on the location airing may even worsen indoor air quality.
- + Air purifiers eliminate these pollutants and particulates and create clean and healthy air.
- + With air humidification, you can maintain humidity at an optimal level of 40-60% and avoid the unpleasant effects of too dry air.

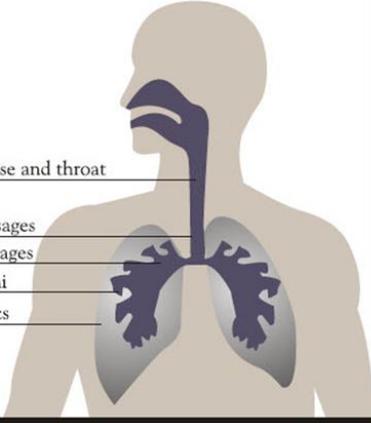
Particulate matter is considered as most dangerous air pollutant. In view of this point please find below some interesting facts:

- Particulate matter (PM) is one of the most dangerous substances in the air since it can penetrate sensitive areas of human respiratory area. A long-term exposition to PM is harmful to health and reduces life expectancy.
Source: World Health Organization WHO
- More than 90% of world's population suffers from polluted air. This is the result of a WHO (World Health Organization) study. Dangerous **particulate matter**, mainly caused by combustion processes, **kills approx. 7 million people worldwide each year**.
Source: World Health Organization WHO
- According to a European Environment Agency's report **PM** in the air **causes** around **430.000 early deaths in the European Union each year**.
Quelle: derstandard.at
- Approx. **47.000 of these fatalities happen in Germany**.
Source: Ministry of Transport and Infrastructure Baden-Wuerttemberg
- In **2015 Germany** had **3.475 traffic fatalities**.
Source: German Ministry of Transport
- **Two new studies question current limits for particulate matter. Already moderate brief exposure increases the risk for heart attack as well as for lung cancer.** Even moderate and brief air pollution seems to harm health of people more than medical experts so far thought. This is indicated by a big new epidemiological meta-analysis (35 studies from 12 countries).
Source: www.thelancet.com
- **Particulate matter causes various diseases:** Lung cancer, asthmatic diseases, respiratory diseases, etc.
Now a growing body of evidence suggests that Alzheimer's has to be added to this list. In the brains of decedents with neurodegenerative disease scientists found iron oxide nanoparticles, one of the main components of man-made PM.
Source: German Doctor's Newspaper

Where airborne particulate go.

Particle Size	Effect
5.5 - 9.2 microns	Lodges in nose and throat
3.3 - 5.5 microns	Main breathing passages
2.0 - 3.3 microns	Small breathing passages
1.0 - 2.0 microns	Bronchi
0.3 - 1.0 microns	Air sacs

PM 10 refers to particulate matter that is less than 10 microns in size.



The smaller the more dangerous. Small particles can deeply penetrate one's respiratory system.

Particulate matter causes

- Cardiovascular diseases (heart attack)
- Damages the respiratory tract
- Lung diseases (13 - 15% of deaths by lung cancer in Germany are caused by PM)
- Cancer and
- Most likely favours the development of Alzheimer's and dementia

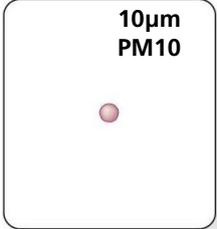
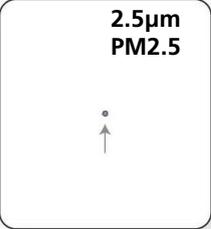
Natural sources of PM

- + Soil erosion
- + Pollen count
- + Forest and bush fire

Manmade sources of PM

- + Industrial processes
- + Heating plants
- + Road traffic (main source)
- + Farming
- + Construction activity
- + Households, especially wood heating / wood-fired ovens

Types of PM and limit values

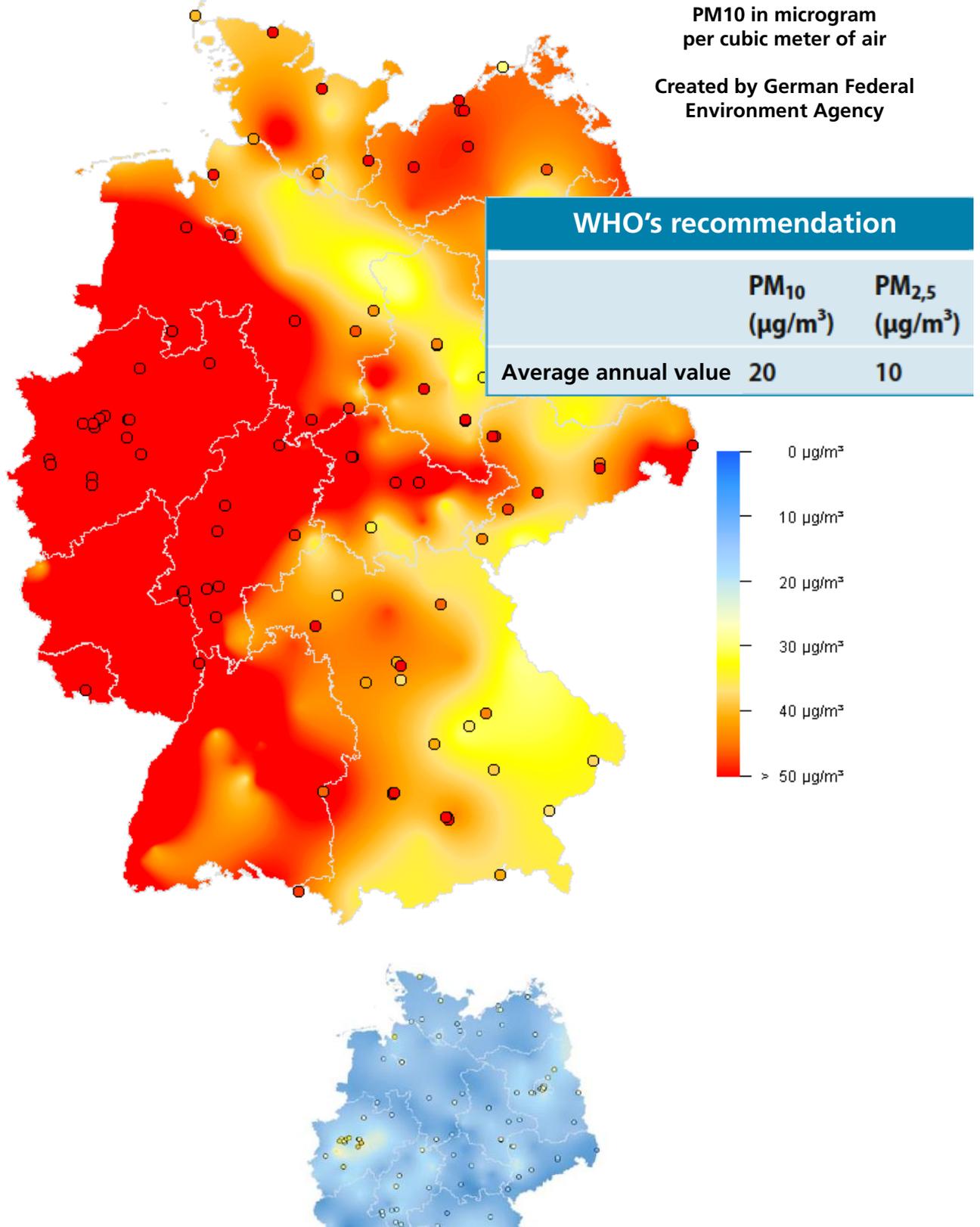
 <p>70µm Hair</p>	 <p>50µm Sand</p>	<p>$\mu\text{m} =$ Micrometre = 0,001 mm</p>	<p>Unfortunately there is no uniform regulation.</p> <ul style="list-style-type: none"> • China for example is focusing on PM2,5 level • In Germany PM10 level is standard, for PM2,5 there is no measuring station system <p>From 50µg/m³ there is "PM alert".</p> <p>Measured values of 20µg/m³ - 50µg/m³ are, however, already clearly harmful to health</p> <p>German Federal Environment Agency and WHO recommend to fall below a yearly average of 20µg/m³.</p>
 <p>10µm PM10</p>	 <p>2.5µm PM2.5</p>		
			<p>Our particle counters measure 3 main types of PM.</p> <p>We focus on PM10 value, it should be clearly under 20µg/m³, at best below 10µg/m³.</p> <p><u>Note:</u> Prior to a product demonstration we recommend to execute a control measurement. For example, due to rainy conditions measured values can temporarily be very low.</p>

Daily average of particle concentration

19.03.2015

PM10 in microgram
per cubic meter of air

Created by German Federal
Environment Agency



Rain helps only for a short period.

Particulate matter is caused by agricultural operations, industrial processes, combustion of wood and fossil fuels, road traffic, etc.



Frankfurt am Main / Germany, Summer 2016

Air that is polluted with various substances causes various symptoms:

- SBS (Sick building Syndrome) = Weakened immune system, kidney and liver dysfunction, headache, irritations of eyes and respiratory tract, etc.
- COPD (chronic obstructive pulmonary disease) = Sputum, cough & shortness of breath, etc.
 - 10 – 12% of adults older than 40 years in Germany suffer from COPD
 - In 2020 COPD will be the third leading cause of death worldwide behind heart attacks and strokes
- Air pollutants can trigger or worsen allergies.
- Disease transmission of many illnesses happens by droplet infection (e.g. influenza).
- Mould spores can trigger many symptoms: Bronchitis, fever, increased susceptibility to infections, etc.
- Particulate matter causes cardiovascular diseases & cancer and most likely favours the development of Alzheimer's and dementia.
- Legionella bacteria cause high fever, chills, thorax pain, etc.
- Etc.

3 months use in a living room with a wood-fired oven.



Filter AP 30 used

Filter AP 30 brand new

Particulate matter and other harmful substances better are stored in the filter than in your body.

Highly efficient, multistage filter system (AP15/30/45/40/100 and AP Pro models)

- + HEPA-cleaning (class H13, efficiency min. 99,97% at a particle size of 0,3µm)
- + Activated carbon cleaning (high amount of activated carbon [AP Pro models even further increased], in all AP models especially impregnated and therefore highly efficient activated carbon)
- + Plasmawave[®] neutralises and destroys viruses such as influenza, bacteria, chemicals, toxins and odours on a molecular level. (AP Pro models do not have Plasmawave[®] due to their different technical structure and due to their even more effective filter system.)

MedShield (AP40/100)

- + Antimicrobial coating of the filter for even more effective removal of pathogens.

Low energy consumption

- + The energy efficient with very low energy consumption.
(Input power from **AP15**: 4W, **AP30**: 4W, **AP45**: 11W; **AP40**: 5W, **AP100**: 10W, **AP60 Pro**: 5W, **AW40**: 10W; **ACC55**: 22W, **AW60**: 5W,)

Super-silent operation

- + Very low noise levels during operation feature IDEAL air purifiers.
(Noise level from **AP15**: 26dB, **AP30**: 26dB, **AP 45**: 27dB; **AP40**: 28dB, **AP100**: 30dB, **AP 60 Pro**: 19 dB, **AW40** < 25dB; **ACC55**: 31dB, **AW60**: 30dB)

Optimized for different room sizes

- + Our AP and AP Pro ranges are optimized for different room sizes: 15m², 30m², 40m², 45m², 60m² und 100m², our air washers AW40/60 for 40m² and 60m² and model ACC55 for 55m².

CLEANCEL[®] (AP15/30/45/40/100 & AW60)

- + Inside the machines the plastic material is coated with additive based on silver ion technique. This inhibits grows of bacteria, fungi and mites. (Due to the special construction of 360° filter in AP Pro models there is no special additive required.)

ECARF certified

+ All AP and AP Pro models are tested and certified with ECARF quality seal for allergy friendly products by the European Centre for Allergy Research Foundation.



Hygiene certified (in Germany) and therefore even suitable for medical facilities

+ All AP and AP Pro models are (or certification is under process) are tested for the use in medical facilities and medical areas according to German VDI directive 6022 (ventilation technology, indoor air quality). Certifying body is well-known Institute Schwarzkopf in cooperation with Hygiene Institute Mainfranken (HIM).

All machines were tested regarding various criteria and considered being suitable for use in medical areas and facilities. This is a unique feature for air purifiers!

- microbiologically (regarding viruses and bacteria),
- mycologically (regarding fungi and fungal spores),
- regarding particulate matter,
- regarding other particulates,
- regarding cleanability and disinfectability of the housings and
- regarding noise emission.



Night mode

+ Super-silent operation in night mode, our air purifiers can be used in sleeping rooms without any problem.

Permanent control of air quality in combination with automatic mode

+ The machines automatically adjust their operating status to the current air quality in the room.

Remote control (AP15/30/45 and AP Pro models) respectively app control (AP100) as well as easy to use displays

+ If desired the operating status can be adjusted manually.

+ AP 100 app is available free of charge on



Easy filter change (all models)

+ A filter change notification ensures that filters are changed in time. This guarantees optimal cleaning performance.

+ All filters can be changed easily and quickly.

Filter lifecycles, etc.

Article	Lifecycle
Filter cassette AP15 / 30 / 45	6-18 mon. (ø 12 mon.)
Filter set (HEPA + carbon) AP40	6-18 mon. (ø 12 mon.)
360° filter AP Pro models	6-18 mon. (ø 12 mon.)
Anti-microbial PM2.5 filter AP100	6-18 mon. (ø 12 mon.)
Activated carbon filter AP100	6-18 mon. (ø 12 mon.)
True HEPA filter AP100	6-18 mon. (ø 12 mon.)
Ionic Silver Stick AW40	1 year
Evaporator cassette ACC55	4-7 weeks
HEPA filter ACC55	4-6 mon.
Activated carbon filter ACC55	4-6 mon.
Combi filter AW60	6-18 mon. (ø 12 mon.)

The lifetime depends on the degree of air pollution and on the intensity of use.
For the evaporator cassette ACC55 water quality and intensity of use are decisive.

Easy cleaning of AW40, ACC55 und AW60

- + The machines either have a cleaning model or can easily be cleaned in the dishwasher (low temperatures, approx. 40° C)
- + Cleaning intervals are as follows:
 - AW40 / ACC55 – 1 x per week without Ionic Silver Stick or every 2 weeks (with ISS)
 - AW60 – Every 2 weeks

Humidification and air cleaning (2 in 1 models AW40/60 and ACC55)

- + The machines provide optimal humidity and a certain level of air cleaning. AW40/60 by means of air washing technology and ACC55 combines regular air cleaning and humidification.

Guideline values for room temperature and humidity

Room type	Temperature	Humidity*
Living and working spaces	Approx. 20°C	Approx. 40-60%
Sleeping rooms	Approx. 16-18°C	Approx. 40-60%
Children's rooms	Approx. 20-22°C	Approx. 40-60%
Kitchens	Approx. 18°C	Approx. 50-60%
Bathrooms	Approx. 23°C	Approx. 50-70%
Cellars	Approx. 10-15°C	Approx. 50-65%

* Mould can develop from a humidity of approx. 70-80%.

* For paper handling, air humidity should be around 50-55% so that the paper itself maintains a humidity of approx. 45-50%.

Fragrance capsule for aroma therapy (ACC55)

- + Fragrances can, depending on your wishes, perfume the air with essential oils (remove activated carbon filter).

Free of charge 14 days trial period (in Germany)

In Germany we offer free 14 days trial periods. The customer only has to bear shipping charges (by parcel service) in case he wants to return the testing unit.

Only in case of the product test shall be in a smoking room we request prior consultation with us. (In case a machine from a product test in a smoking room is returned we have to clean the machine and to exchange the filter due to tar residues.)

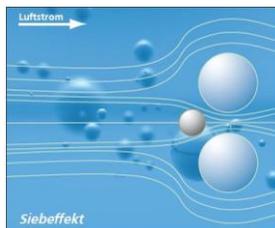
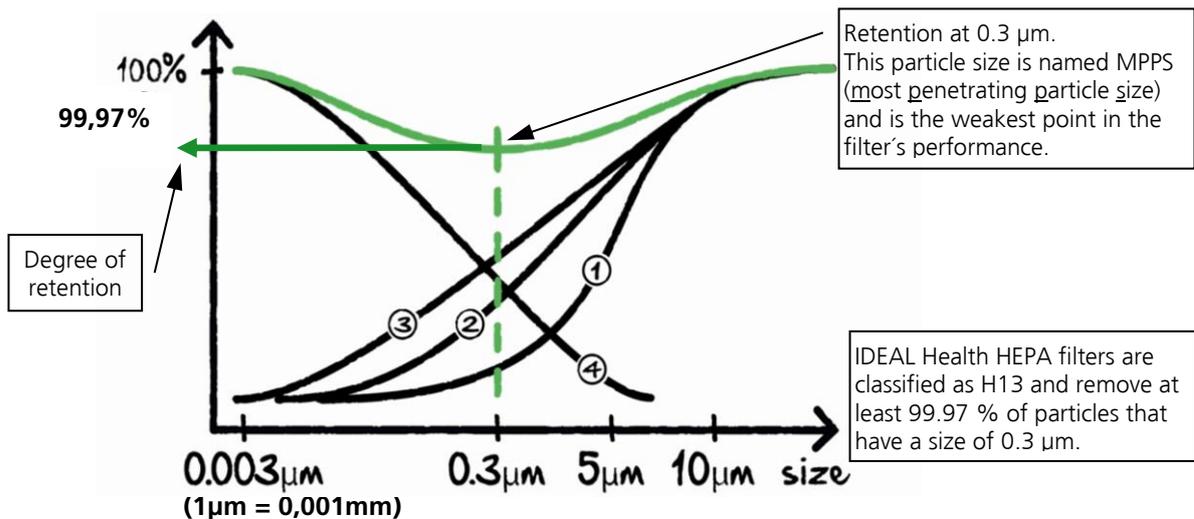
Product groups (S. 8)

	<p>AP 15 / 30 / 45</p> <ul style="list-style-type: none"> + Top purifying performance + Top against odours + Approved for medical areas (in Germany) => Very good air purification
	<p>AP 40 / 100</p> <ul style="list-style-type: none"> + Top purifying performance + Top against odours + Approved for medical areas (in Germany) + Specialized equipment (better sensors, MedShield) <p>=> Excellent air purification</p>
	<p>AP 60 Pro</p> <ul style="list-style-type: none"> + Top purifying performance + Top against odours + Approval for medical areas (in Germany) in preparation + Outstanding sensors + Quality Made in Germany + Compared to machine size very powerful + Outstandingly quiet <p>=> Best possible air purification Made in Germany</p>
	<p>ACC 55</p> <ul style="list-style-type: none"> + Very good humidification + Very good purifying performance + Good against odours + With fragrance option + Hygienical cold evaporation <p>=> Good air purification & good humidification</p>
	<p>AW 40 / 60</p> <ul style="list-style-type: none"> + Outstanding humidification + Removes house dust and pollen from the air + Hygienical cold evaporation <p>=> Best possible humidification</p>

Filterable substances & mechanism (S. 9-10)

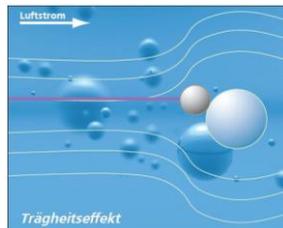
- + Dust particles like toner powder, fibres, particulate matter, etc.
- + Allergens like pollen, dust, pet hair, etc.
- + Odours like kitchen smell, tobacco smoke, chimney smoke, etc.
- + Potential pathogens like bacteria, viruses and mould spores
- + Chemicals like volatile organic compounds (VOC), formaldehyde, toluene and other evaporations (furniture, carpets, construction materials) etc.

Mechanism of HEPA filters (High Efficiency Particulate Arrestance) vs. particulates



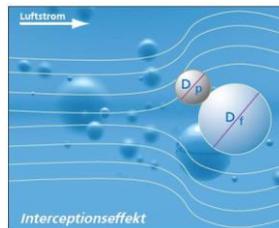
(1) Impaction:

Very large particles are caught between the fibers.



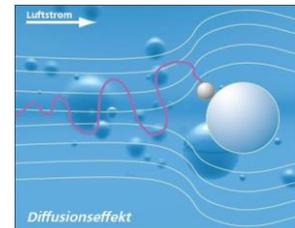
(2) Inertial effect:

Large particles do not follow the air flow and remain captured due to their inertia.



(3) Interception effect:

A small particle touches the fiber and is captured.



(4) Diffusion effect:

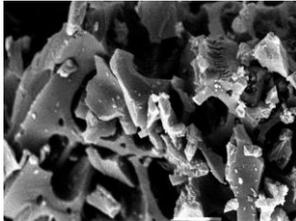
Very small particles hit the filter fiber and stick to it.

What is the size of particles?

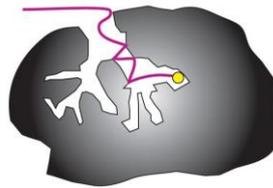
Particle	Size (1 μm = 0,001mm)
Viruses	0,001 – 0,4 μm , influenza = 0,1 μm
Tobacco smoke and aerosols	0,01 – 1 μm
Bacteria	0,5 – 5 μm , MRSA = 0,8 und 1,2 μm .
Mould spores	5 – 15 μm
Dust	60 – 20.000 μm
Particulates	Inhalable particulates < 10 μm (PM10) Respirable particulates < 2,5 μm (PM2,5)

Mechanism of activated carbon vs. odours and chemical substances

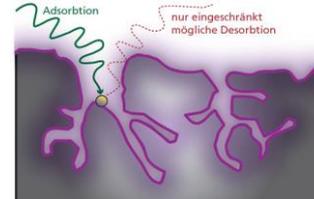
By Physisorption (adsorption by physical forces) molecules are captured in activated carbon. The larger the inner surface area of the activated carbon is, the bigger the effect of adsorption is. In our IDEAL Health air purifiers 1 gr of activated carbon has an inner surface area of 1000 m². Additionally our activated carbon has a so-called impregnation of very high quality. This impregnation enhances effectiveness (especially chemisorption).



Activated carbon under an electron microscope



Adsorption:
The adsorbing molecule is attracted to the surface by physical forces.



Chemisorption:
The adsorbing molecule is attracted to the surface due to chemical reactions.

Examples of filterable substances:

Acetone	Chlorine	Hospital odours
Acetaldehyde	Diesel oil vapor	Carbon dioxide
Alcohol	Acetic acid	Menthol
Essential oils	Disinfectant	Methane
Ethyl Amines	Formaldehyde	Phosgene
Petrol	Household odours	Smell of perspiration
Benzene	Kerosene	Turpentine
	Body odour	Tobacco odour